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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/787,364

05/29/2001

Kousuke Suzuki

108946

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25944

7590

09/24/2002

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EXAMINER

KIM, PETER B

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/787,364

Applicant(s)

SUZUKI, KOUSUKE

Examiner

Peter B Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-19, 22-28 and 31-35 is/are rejected.
- 7) ☒ Claim(s) 20, 21, 29 and 30 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 9, line 3, there seems to be a typo or a printing error.

Appropriate correction is required.

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a "certain device" of Claim 31 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-8, 10, 25 and 33 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as

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to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1 and 25, changing the structural condition of the image pattern is not described in the written description.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-8, 10, 11, 25 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 25, the recitation of changing "illumination condition for illuminating the pattern" seems to refer to changing of a wavelength described in the written description, however, the claims further recite "changing a wavelength" which seems to be separate from changing "illumination condition."

Regarding claim 11, it is unclear what is meant by "the installation environment of the assembly location," because according to claim 4, the installation environment is different from the assembly location.

The remaining claims, not specifically mentioned, are rejected for incorporating the defects from the base claim by dependency.

The following prior art rejections are based on the examiner's best understanding of the claims.

Claim Rejections - 35 USC § 102

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8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 1-3, 5-8, 12, 13, 14, 17-19, 22-26, 31-33 and 35 are rejected under 35 U.S.C. 102(a) as being anticipated by Shinonaga et al. (Shinonaga) (5,838,426).

Shinonaga discloses an adjustment method comprising changing at least one condition of illumination condition by changing a wavelength of illumination light for illuminating the pattern on the first surface (1) (col. 6, lines 13-39), and detecting a change amount of image formation characteristics of an image projected onto the second surface (9) via the projection optical system (7) (col. 10, lines 43-60, detecting changes in focusing), and determining a predetermined relationship between a change amount of installation environment of the projection optical system and the change amount of the image formation characteristics for each condition based on a result of the detection (col. 9, lines 25-55, and col. 10, lines 43-60, storing in memory the amount of change in relative refractive of air based on change in pressure, and the change in focus position). Shinonaga also discloses changing the wavelength of light based on the predetermined relationship (col. 9, lines 25-39).

Shinonaga discloses an exposure method and apparatus with a illumination optical system (27, 28, 29), a projection optical system (7), wavelength adjusting device (32), an image formation characteristic measurement system (col. 10, lines 43-60, detecting changes in focusing). A control system (Fig. 1, 15, 13, 17, 31, 32, 17, 16, 22,

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18, 14, 19, 20, 21), connected to the wavelength adjusting device and the image formation characteristics measurement system (Fig. 1), changing at least one condition of illumination condition by changing a wavelength of illumination light for illuminating the pattern on the first surface (1) (col. 6, lines 13-39), and detecting a change amount of image formation characteristics of an image projected onto the second surface (9) via the projection optical system (7) (col. 10, lines 43-60, detecting changes in focusing), and determining a predetermined relationship between a change amount of installation environment of the projection optical system and the change amount of the image formation characteristics for each condition based on a result of the detection, and a memory (23) connected to the control system (col. 9, lines 25-55, and col. 10, lines 43-60, storing in memory the amount of change in relative refractive of air based on change in pressure, and the change in focus position). Shinonaga discloses an installation environment measuring system for measuring and determining a change amount of the environment (22, 19, 21, 20), and changing a wavelength of the illumination light according to the change amount of installation environment (col. 9, lines 25-55). Besides the first technique for adjusting the image formation by changing the wavelength, Shinonaga also discloses changing the image formation characteristics (change in focusing in Shinonaga) by correcting the focus position of the wafer (col. 10, lines 48-60). Shinonaga discloses in col. 4, line 57 – col. 6, line 29, the preparation operation for projecting the image of the pattern. Shinonaga also discloses the method and the apparatus wherein the change amount of the environment is the difference between the measure and reference environment (col. 10, lines 61-67), and the change

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amount of the image formation characteristics is caused by change in wavelength (col. 10, lines 48-60). Shinonaga also discloses the projection optical system made of plurality of glass (col. 11, lines 64-67), and providing gas supplied inside the projection optical system and the change environment is the change of the atmospheric pressure (col. 9, lines 7-62).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4, 10, 11, 15, 16, 27, 28, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinonaga et al. (Shinonaga).

Shinonaga discloses the claimed invention as discussed above, however, Shinonaga does not disclose changing of the wavelength of light according to the installation environment of the relocated location in advance when assembling the projection optical system at a location different from the installation environment. Shinonaga also does not disclose transferring the device pattern onto a work piece using the exposure method. Although Shinonaga does not disclose different installation environment or assembly location, since Shinonaga teaches storing in memory amount of change in refractive index according to change in pressure and accommodating the change by controlling the wavelength, it would have been obvious to one of ordinary

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skill in the art to adjust the wavelength upon determination of the installation environment to properly set the wavelength at the assembly location, and to carry out the pattern transfer once the apparatus is installed.

Also, although Shinonaga does not disclose holding the environment of the optical system constant during the change of the wavelength, adjusting of the projection optical system, and a second adjustment for controlling the pressure inside the optical system in the embodiment of Fig. 1, in the embodiment of Fig. 4, Shinonaga discloses holding the environment constant, adjusting the projection optical system and controlling the pressure inside the optical system (col. 11, lines 6-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the technique of adjusting the wavelength and the technique of adjusting the optical system together because having two techniques would lend to more flexibility and accurate adjustment according to the changes in the environment.

Allowable Subject Matter

12. Claims 20, 21, 29, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art of record teaches or discloses an exposure method or apparatus with a first and second image formation characteristic adjustment where the second technique is applied when the first technique could not completely make the

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correction or when the change amount of the change in the environment is greater than a predetermined value.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'Peter B. Kim', with a stylized flourish at the end.

Peter B. Kim
Patent Examiner
September, 20, 2002